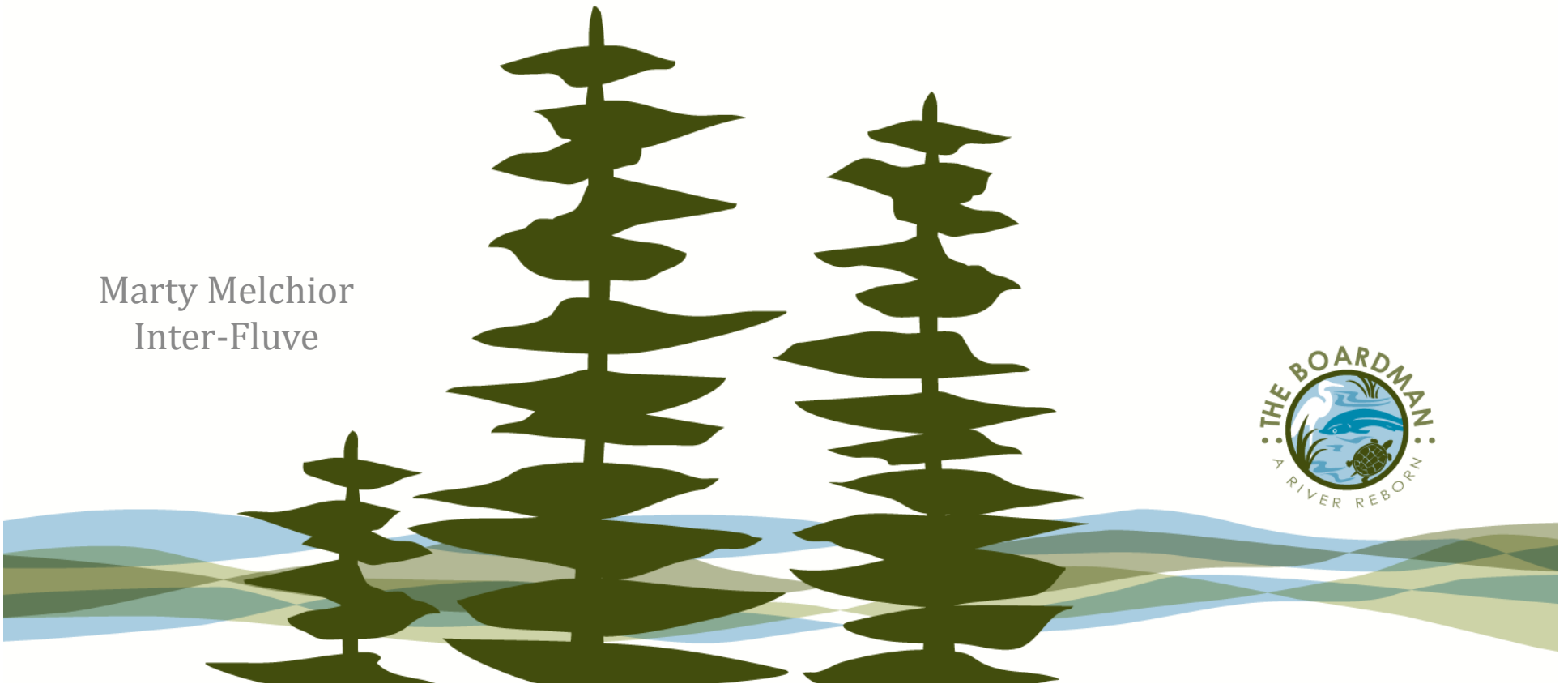


The Boardman: A River Reborn

Removing Dams for a Free Flowing River

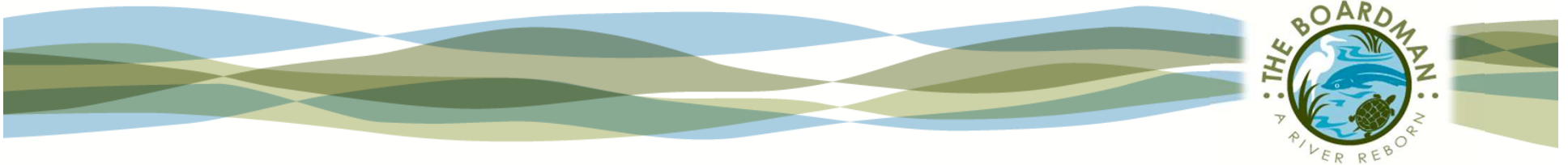
Advances in Design and River Restoration Techniques : Part 2

Marty Melchior
Inter-Fluve



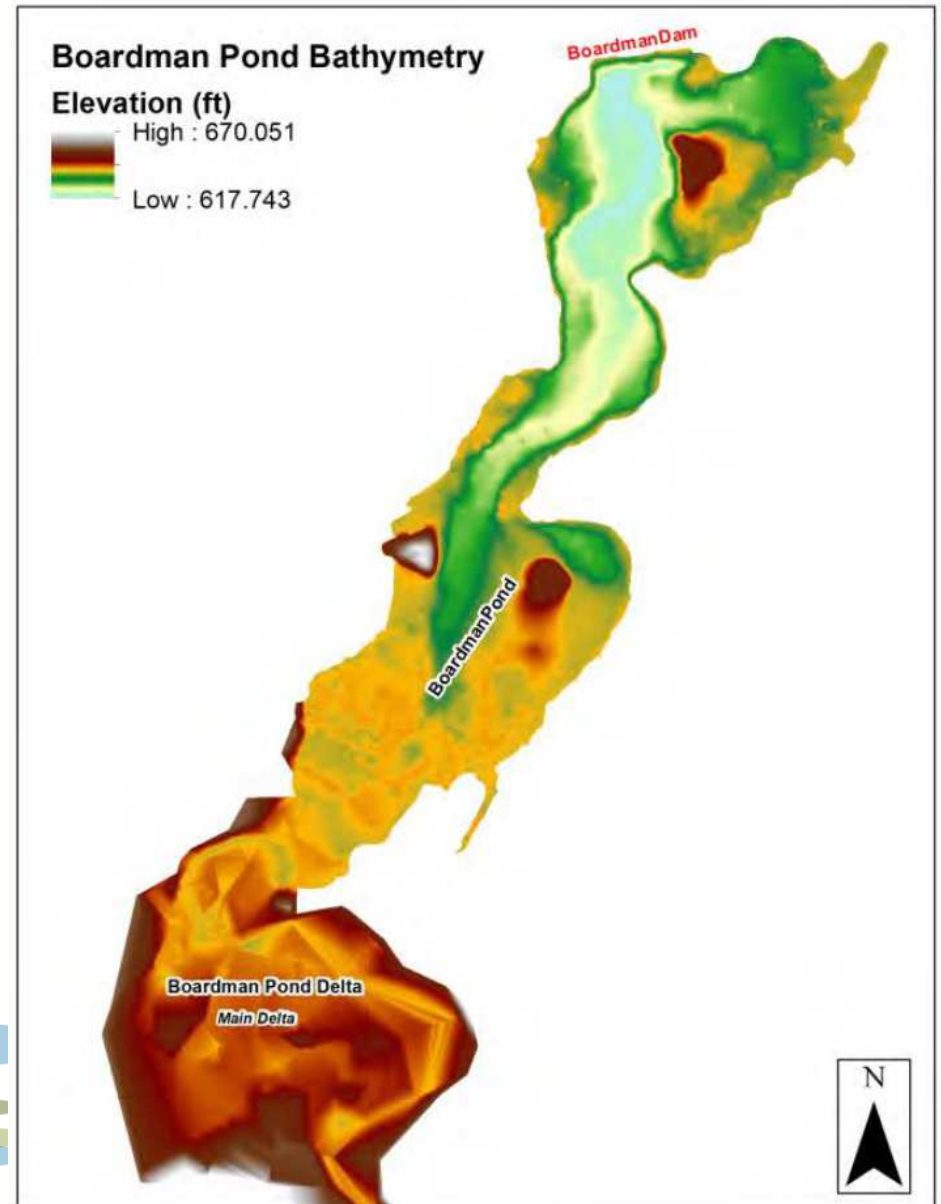
River Restoration Design

- Step 1 - Using past and current river information to help guide design:
 - Investigate the historic channel morphology
 - Slope
 - Planform alignment (Sinuosity)
 - Channel shape/cross-section
 - Bed, bank and floodplain soils



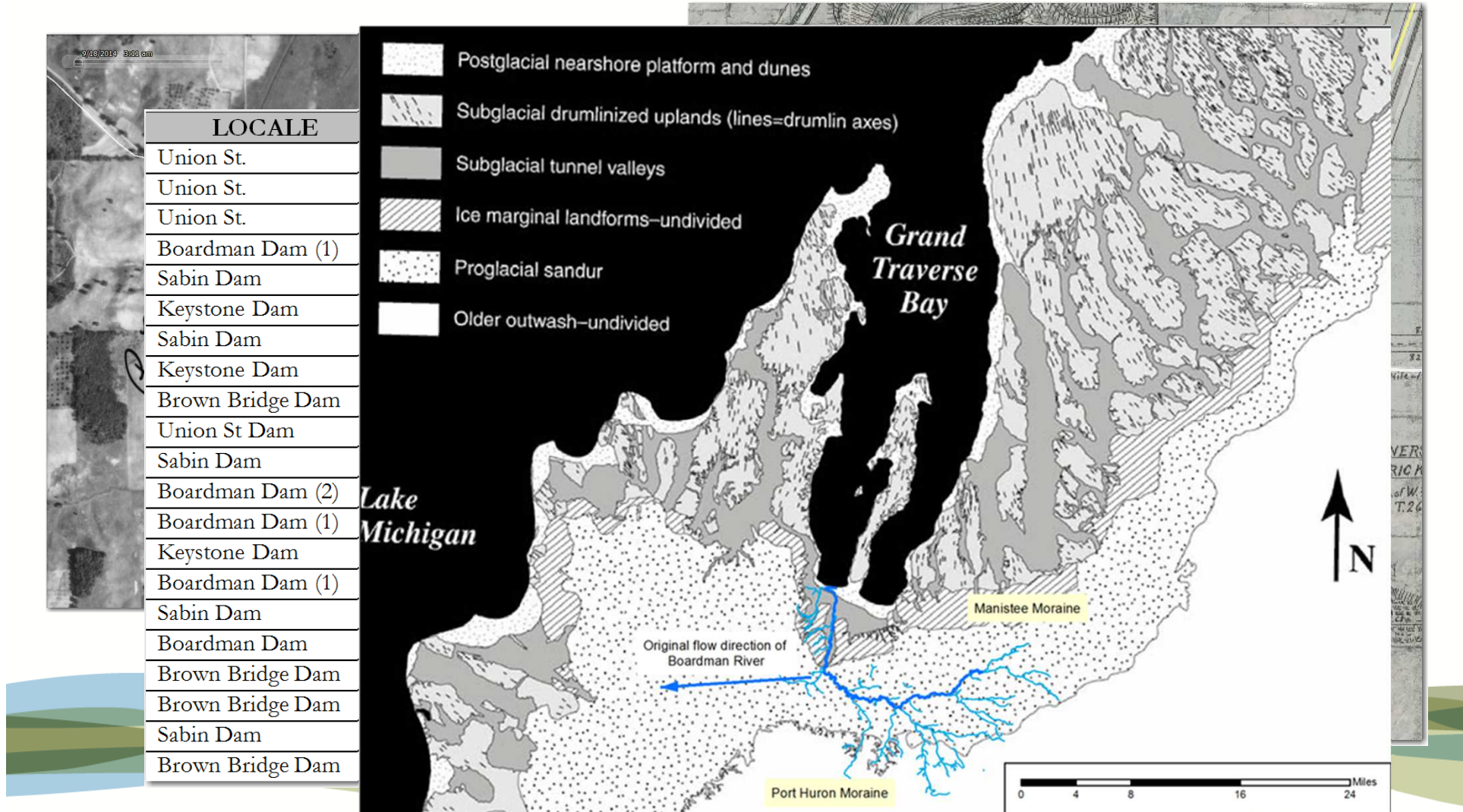
River Restoration Design

- Finding the historic channel alignment
 - Bathymetry
 - Depth to refusal
 - Manual coring
 - Historic maps
 - Historic survey
 - Aerial photographs

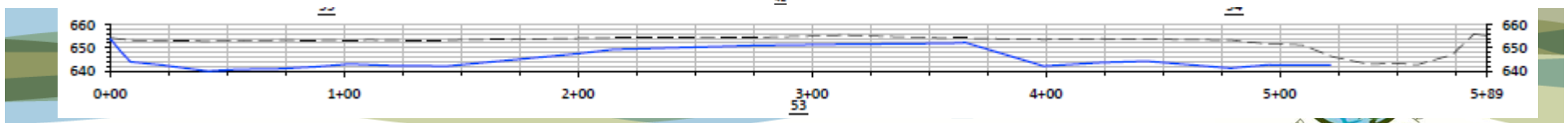
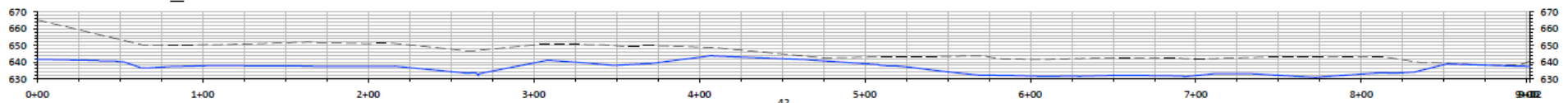
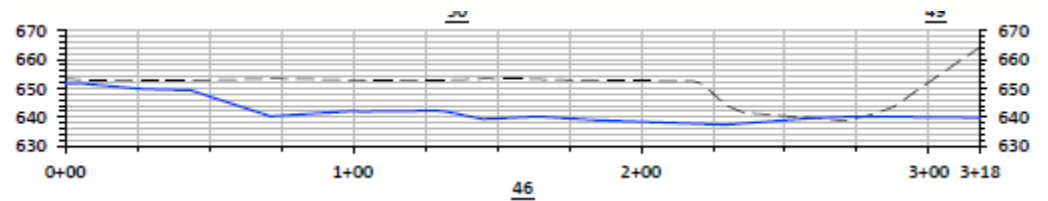
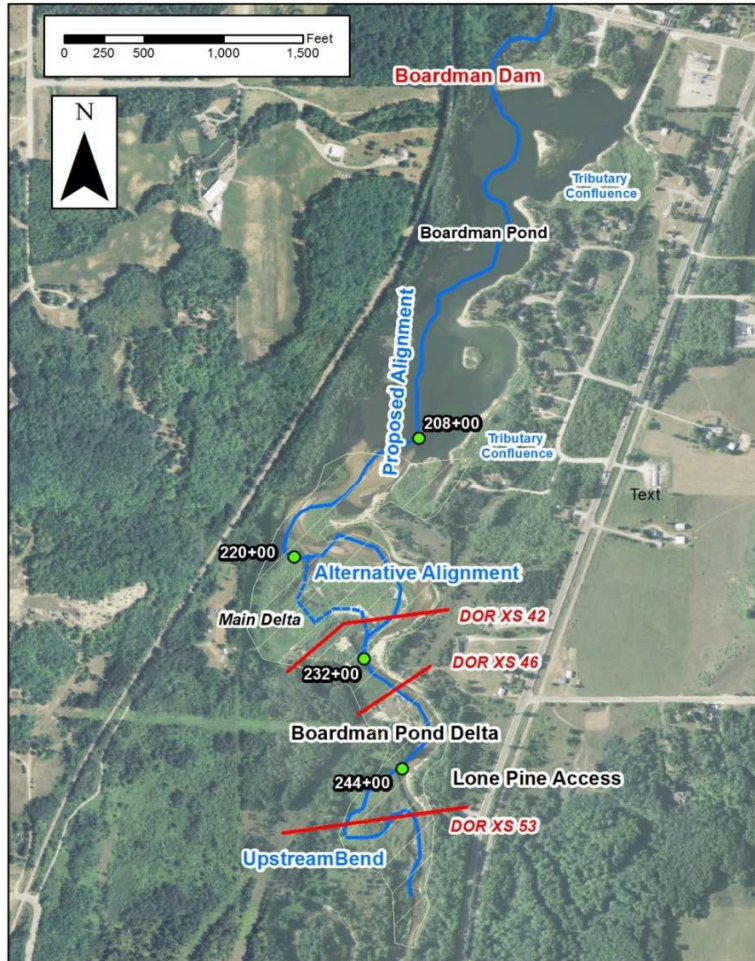


Literature Review

- Assess geomorphic drivers on the river



Subsurface Investigation (DOR/Hand cores)



Floodplain and channel analogs

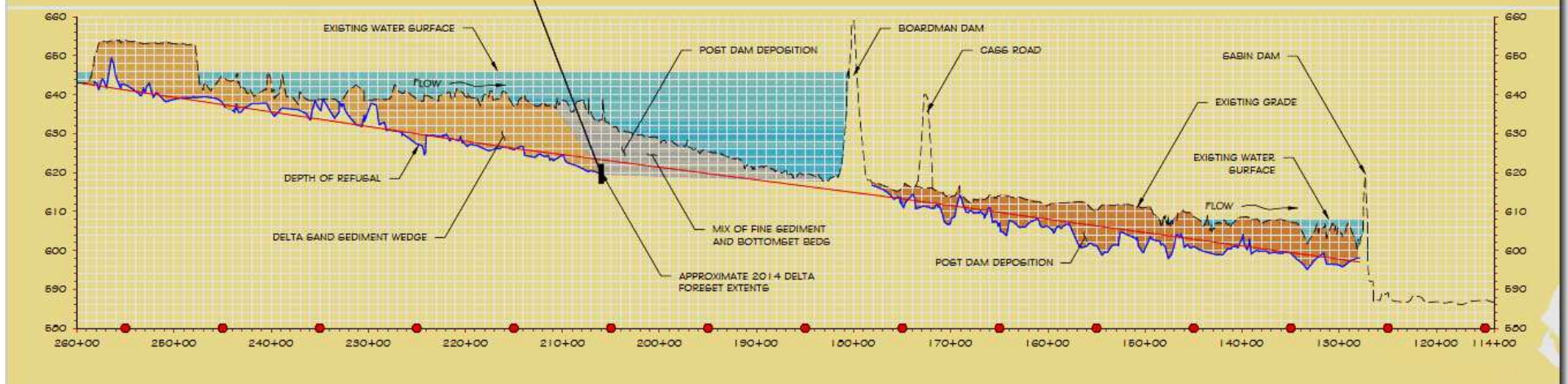
- Relic channel segments
- Floodplain morphology
- Defining long term planform changes

Profile (slope) survey data



Sheet Index

2/8



River Restoration Design

A photograph of a river with a large pile of fallen branches and logs in the middle, creating a riffle. The background shows a forested bank.

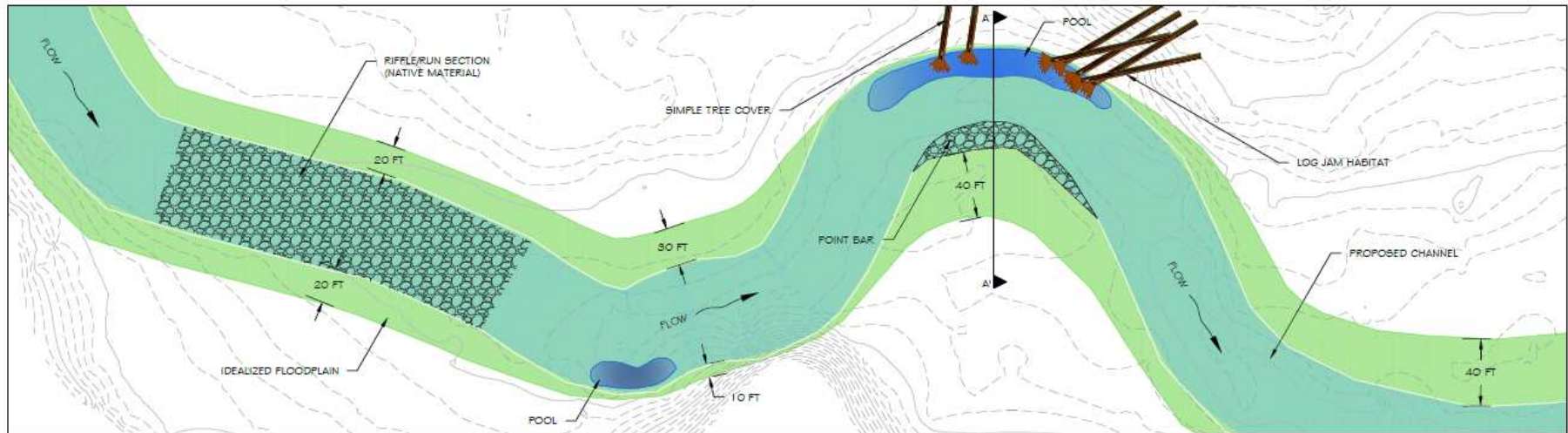
- Step 2 – Defining existing river processes to help guide design of potential habitat:
 - Define habitat (wood, riffles, pools, depositional features, floodplain communities)

River Restoration Design



- Step 2 – Defining existing river processes to help guide design of potential habitat:
 - Define constraints (modern and future hydrology, landuse, infrastructure)
 - Evaluate sediment transport
 - Assess near and long term evolution of river

River Restoration Plan



CHANNEL & FLOODPLAIN EXCAVATION

CHANNEL AND FLOODPLAIN EXCAVATION WILL OCCUR THROUGHOUT THE BOARDMAN AND SABIN IMPOUNDMENTS TO REVEAL THE PRE-DAM FLOODPLAIN SURFACE AND IN-CHANNEL FEATURES. EXCAVATION CAN PROCEED IN THE CHANNEL AREA FIRST, THEN FOLLOWING DRAWDOWN, THE FLOODPLAIN CAN BE REMOVED AS WELL.

BANK TREATMENT

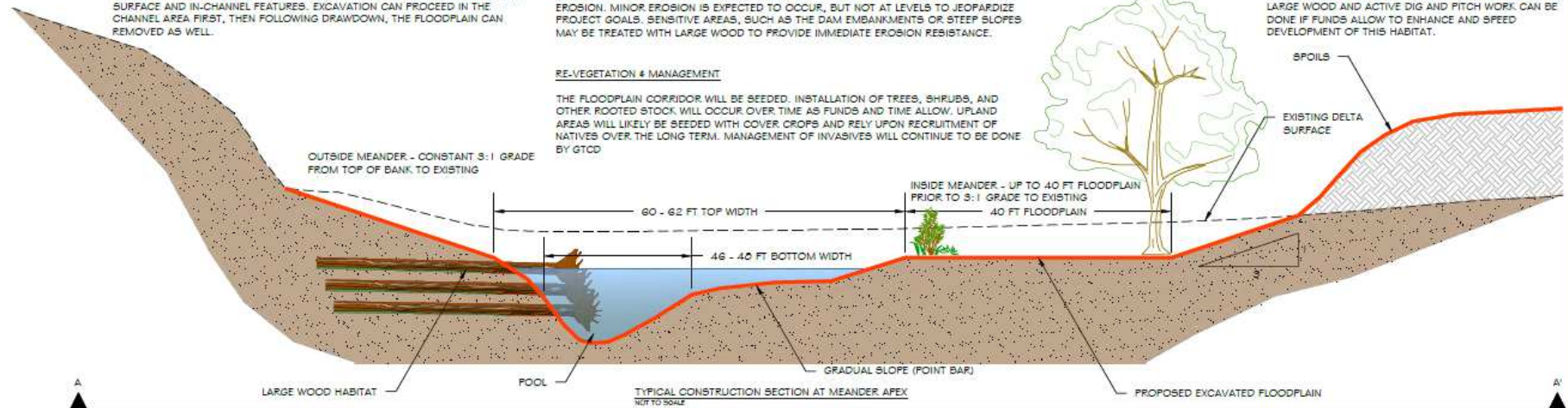
CHANNEL BANKS WILL BE ALLOWED TO SELF STABILIZE. A SEED BANK AND RELIC BANK MARGIN EXISTS BELOW THE SEDIMENT THAT WILL PROVIDE SHORT TERM RESISTANCE TO EROSION. MINOR EROSION IS EXPECTED TO OCCUR, BUT NOT AT LEVELS TO JEOPARDIZE PROJECT GOALS. SENSITIVE AREAS, SUCH AS THE DAM EMBANKMENTS OR STEEP SLOPES MAY BE TREATED WITH LARGE WOOD TO PROVIDE IMMEDIATE EROSION RESISTANCE.

RE-VEGETATION & MANAGEMENT

THE FLOODPLAIN CORRIDOR WILL BE SEEDED. INSTALLATION OF TREES, SHRUBS, AND OTHER ROOTED STOCK WILL OCCUR OVER TIME AS FUNDS AND TIME ALLOW. UPLAND AREAS WILL LIKELY BE SEEDED WITH COVER CROPS AND RELY UPON RECRUITMENT OF NATIVES OVER THE LONG TERM. MANAGEMENT OF INVASIVES WILL CONTINUE TO BE DONE BY GTCD.

HABITAT

IN-CHANNEL HABITAT WILL DEVELOP DURING FLOOD EVENTS AS THE RIVER RECOVERS FOLLOWING REMOVAL. LARGE WOOD AND ACTIVE DIG AND PITCH WORK CAN BE DONE IF FUNDS ALLOW TO ENHANCE AND SPEED DEVELOPMENT OF THIS HABITAT.



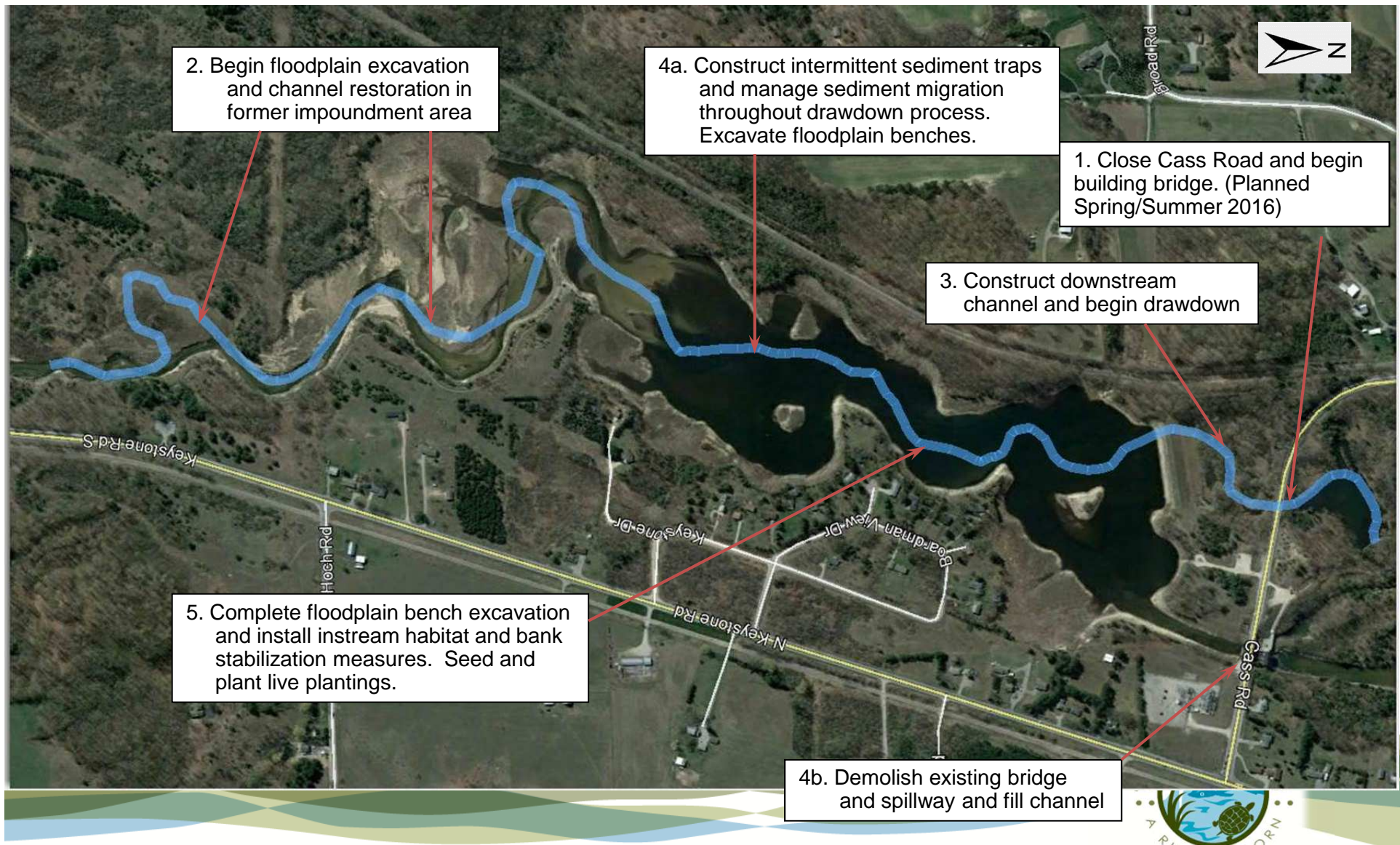
Typical Details

Alvarado and Salazar / *Translational Research on HIV Prevention* 11(4) 303-313 313

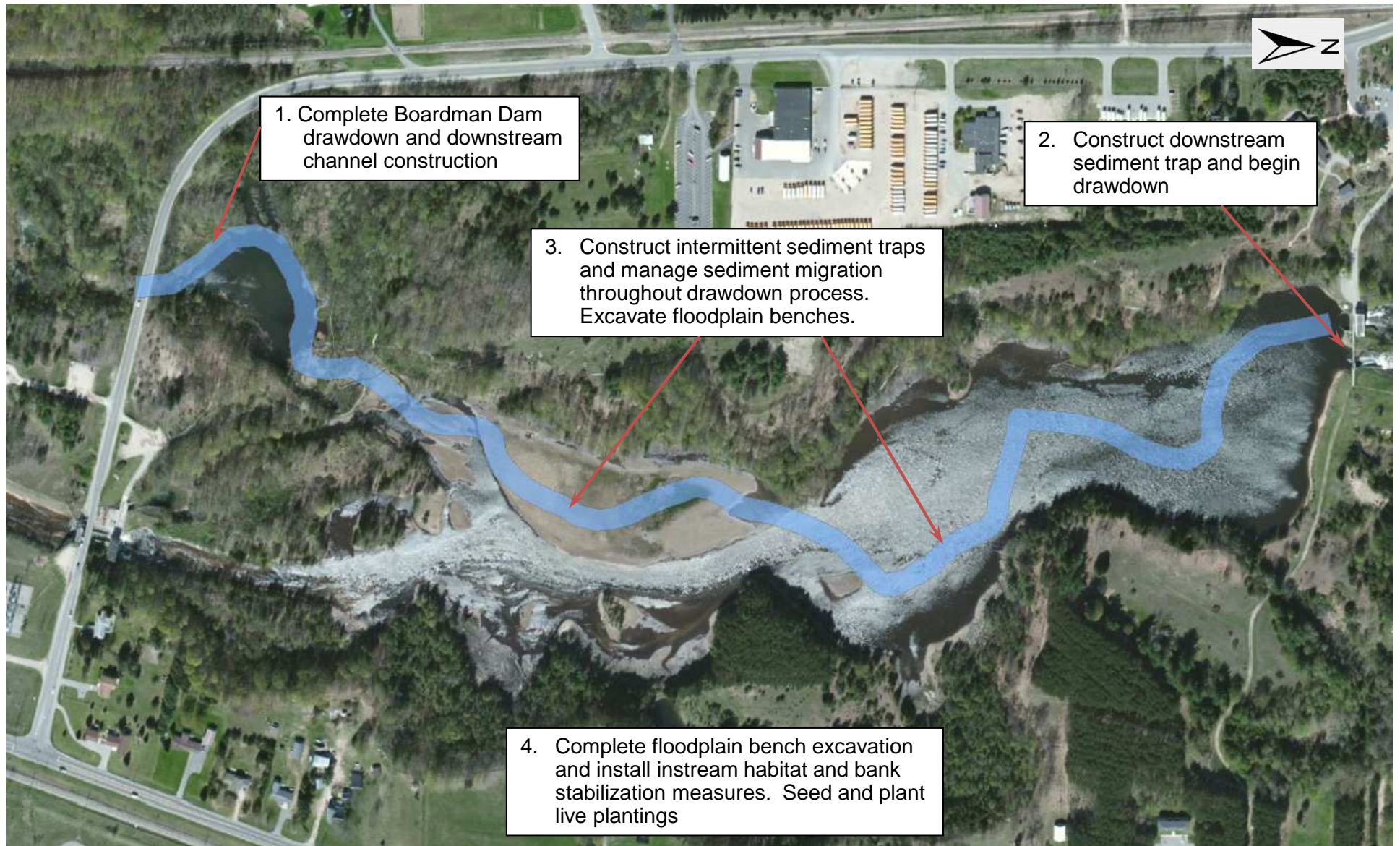


- Boardman Dam impoundment restoration plan view

Boardman Dam Removal Construction Sequence

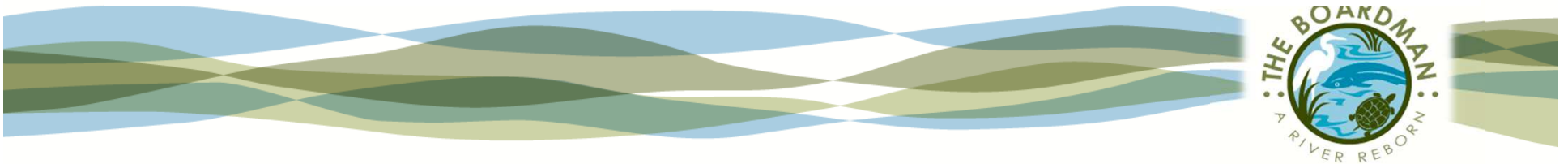


Sabin Dam Removal Construction Sequence



Habitat Restoration Components

- Large wood
- Riffles and pools
- Floodplain restoration
- Microtopography
- Riparian revegetation



Habitat Restoration Components

- Large wood placement



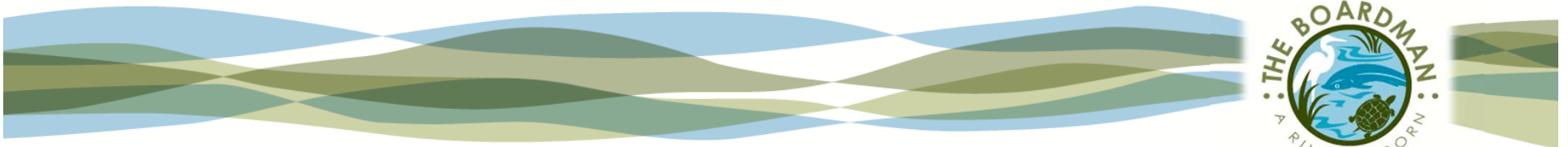
Habitat Restoration Components

- Riffles and pools



Habitat Restoration Components

- Floodplain restoration



Habitat Restoration Components

- Floodplain restoration and microtopography grading



Habitat Restoration Components

- Riparian vegetation restoration



Brown Bridge impoundment 2015

Thank you

